

A. M. U. - P. D.

1961 Convention Announced

The 1961 Convention of the A. M. U.-P. D. will be held June 28 noon through July 1 noon on the Santa Barbara Campus of the University of California at Goleta. Accommodations will be available in the Anacapa Hall, near the Marine Laboratory at the beach. Detailed information will be sent out the early part of 1961. Reserve the above dates in your date book and plan to attend. A fine program is being arranged for the meetings on this beautiful Campus.

Howard R. Hill,
Chairman

SORENSEN COLLECTION

Mr. Andrew Sorensen of Pacific Grove has given his entire collection of shells and other invertebrates to the California Academy of Sciences. This large and important world-wide collection has been transported to the Academy in Golden Gate Park, San Francisco, requiring three trips to Mr. Sorensen's home with two trucks to make the move.

Mr. Sorensen, now 97 but still active, did a great deal of collecting in the Gulf of California. His shells from the Gulf form a major and important segment of his collection which is not only of great scientific value but beautiful as well. His accounts of this collecting work appeared in the *Nautilus* from 1942-1948 and in the *Minutes of the Conchological Club of Southern California* in 1948 and 1949. In addition, he added many valuable series of specimens by purchase and exchange from Japan, Australia, and other foreign lands. He specialized in the abalones, especially the West Coast species, and his abalone collection is probably unexcelled. There are many interesting things from the Monterey Bay area taken in deep water.

According to Dr. Leo Hertlein and Allyn G. Smith of the Academy, it will be some time before Mr. Sorensen's collection can be reviewed in its entirety.

Information Desk

{We have received an inquiry relating to the technique involved in making microscope preparations of radulae for study of species relationships. This inquiry was referred to Dr. Harry K. Fritchman, who has probably made more radula preparations than any other person to whom we might have turned. Dr. Fritchman kindly sent the following answer, for which we are grateful.

The Editor}

Preparation of Radulae

by

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The identification of gastropods is frequently made difficult by the erosion of the shell by sand and gravel or by fungi. In such cases identification may often be made by examination of the radula. Briefly, the radula is a feeding structure present in all Mollusca except the Pelecypoda. It is a ribbon of semitransparent material to which are affixed in a linear series the teeth and plates which support them. This organ is contained in the radula sac, an outgrowth of the oral cavity, and the arrangement of the teeth and the tooth plates is frequently distinctive for each species. The method of preparation described below has been used by me in the study of *Acmaea radulae*. It is doubtful whether it is applicable, without modification, for all radular types but it may serve as a point of departure for elaborating other techniques.

Regardless of the method of preservation, whether wet or dry, the specimen should be soaked in fresh water overnight. The method used to separate the radula from the body will depend on the size of the animal. If the specimen is less than two inches long, the entire body may be removed from the shell, placed in a vial, covered with a ten percent solution of sodium hydroxide and heated in a pan of water at a temperature just uncomfortable to the touch. If the specimen is larger, it is not economical to dissolve the entire body and the radula must be dissected out before being treated with the reagent. For a limpet an inch in length, a thirty minute treatment will dissolve the body leaving

the radula intact. The radula is then removed from the vial with a dissecting needle and transferred to a watch glass of water. *Acmaea* radulae are best studied with the teeth removed. This removal can be done in a watch glass of water by holding the end of the ribbon with forceps and gently brushing the teeth off with a fine camels hair brush. If the treatment with the hydroxide was too long or at too high a temperature, the tooth plates will also be removed, leaving little for study except the bare ribbon.

After rinsing in clean water, the ribbon may be stained in aceto-carmine which is prepared by boiling a small amount of powdered carmine in 40% acetic acid until a saturated solution is obtained. After cooling it is filtered and is then ready for use. *Acmaea* radulae stain in thirty seconds to one minute and are then transferred to 70% ethyl alcohol for a minute and then to 95% alcohol. A microscopic slide and cover slip are prepared by cleaning them in alcohol, drying them and placing a drop of Euparal in the center of the slide. The ribbon is then placed in the Euparal, care being taken that the toothed side is up. Some skill is required to prevent twisting and kinking. More Euparal is added if needed and the cover slip is carefully lowered into position. The slide may be examined immediately under a microscope but it must be kept horizontal for a few hours until the Euparal has hardened. The slide is labeled with the information as the shell from which it came. If a large number of radulae are to be prepared at one time, they can be identified by dropping into each vial a small label cut from an index card and bearing an identifying number in India Ink.

A few additional suggestions are in order. The most useful size of cover slip is the square 22 mm. of no. 2 thickness. Long radulae may be cut into several sections and mounted side by side. Natural yellow Euparal is the mounting medium of choice since it is miscible with ethyl alcohol and does not require that the material to be mounted be completely dehydrated. If piccolyte or Canada balsam is used, complete dehydration is necessary in 100% alcohol, which in turn must be removed in xylol or tuluol before mounting. (All of the mentioned reagents can be obtained from any large biological supply house.)

Some difficulties to be expected from some non-*Acmaea* radulae will be low stainability, non-removable teeth and a tendency for the sides of the ribbon to roll under. Perhaps fur-

ther work will solve these problems. Finally, it should be mentioned that to compare radulae accurately, the same regions of the ribbons should be examined, regions where the teeth are fully developed and yet not abraded by wear. The smallest radula I have prepared was from an *Acmaea rosacea* Carpenter one-eighth of an inch long. Such work may require a dissecting microscope for manipulating during the de-toothing process if that is done.

Books-Periodicals-Pamphlets

SEASHORE LIFE OF JAPAN

by Kikutaro Baba

Hokuryukan, Tokyo, Japan. Pp. 148 +
10, 4 colored plates. 1958. 500 yen
(about \$1.50).

Even though the captions of this book are almost entirely in Japanese, one can find much of interest in it. A few place names are in Roman type, and Latin names are given for the marine organisms. Even the photographs on the cover are identified on an explanatory page at the front of the book. Following this page is a map showing the locations of all the Japanese marine biological laboratories, with colored arrows to indicate the flow of the oceanic currents. Unfortunately, the map captions are in Japanese and were made understandable to this reviewer by a hand-traced overlay that the author had included in a gift copy. Four colored plates follow the map, with pictures that are repeated elsewhere in the book in black-and-white. The main part of the book consists of photographs of the settings of selected marine biological laboratories, with an array of pictures of the organisms — mostly the invertebrates — characteristic to the area, beginning with Akkeshi, on Hokkaido Island, in the north, and ending with Amakusa Laboratory and the Tokara groups of islands in southern Kyushu. Life histories for many kinds of marine animals are shown, from egg to larval stages, with some unusually fine microphotographs. Dr. Baba's long interest in opisthobranchs is reflected, as one might expect, in his emphasis on this colorful and bizarre group. Many of the pictures show the snails crawling about in their natural surroundings. Eloquent testimony to the hours of patient search that went into this work is the number of pictures of egg-masses